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	Title 2010-2011 SMALL GAME & FURBEARER HUNTER & HARVEST SURVEY	

Abstract: A biennial survey of Indiana small game hunters was conducted following the 2010–2011 hunting season and analyzed to determine harvest and hunter participation. Estimates derived from this survey were quantitatively compared to estimates from the most recent small game survey (2008–2009). A total of 190,883 people held a legal hunting license during the 2010–2011 season; down 0.6% from 192,123 license holders during the 2008–2009 season. Following the 2010–2011 season, questionnaires were delivered to 15,650 license holders and returned by 4,777 (32.3%). The estimated number of people that actually hunted ≥ 1 small game species was 133,942, down 1.3% from 135,639 during the 2008–2009 season. Of our survey respondents, 80.8% of small game and furbearer hunters were satisfied with their hunting experience in 2010–2011, though respondents hunting bobwhite, grouse, and on public land were least satisfied. From respondent harvest information, hunter participation increased for all small game species during the 2010–2011 hunting season. However, state-wide harvests declined for northern bobwhite, American crow, and raccoon in 2010–2011.

Project #: 300FW1W36R01000 Activity # W36R513

The harvest survey is one of the primary tools used by the Division of Fish and Wildlife to assess the status of small game and furbearer populations in Indiana. Small game harvest surveys have been conducted in Indiana from 1940–1966, 1976–1999, and in 2000, 2003, 2005, 2008, and 2010.

Species included in this small game harvest survey are eastern cottontail (*Sylvilagus floridanus*), northern fox squirrel (*Sciurus niger*), eastern gray squirrel (*Sciurus carolinensis*), northern bobwhite (*Colinus virginianus*), ring-necked pheasant (*Phasianus colchicus*), ruffed grouse (*Bonasa umbellus*), American crow (*Corvus brachyrhynchos*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*) and eastern coyote (*Canis latrans*). Mourning dove (*Zenaidura macroura*) and American woodcock (*Scolopax minor*) harvest is calculated through the Harvest Information Program (HIP) and can be found in different reports.

Most people hunting small game in Indiana must purchase a hunting license. Participation and

harvest estimates derived from this survey do not include people exempt from purchasing a license.

Methods

Following the 2010–2011 small game season, a harvest survey questionnaire (Figure 1) was initially sent to 15,650 license holders. Each returned survey was entered into our database as they came in, and the data analysis did not begin until August 2011. Correction factors developed from the 1980 and 1985 surveys were used to adjust harvest estimates for response and non-response bias (Pfingsten 1980, Rolley 1985, Frawley 1997). For analysis purposes, the state was stratified into 6 small game harvest regions (Figure 2B) or 5 ring-necked pheasant harvest regions (Figure 2A). If less than 10 surveys were received for any one species in a particular region, it was determined that the data was insufficient to provide reasonable estimates for the harvest parameters, and the data was excluded from all descriptions in this report (Veverka 2008). Harvest and effort parameters derived for this report were quantitatively compared



to the same parameters calculated in the most recent small game survey, 2008–2009 (Veverka 2009).

Results

Initially sent to 15,650 Indiana hunting license holders, 14,806 questionnaires were delivered successfully. A total of 4,777 people returned questionnaires yielding a 32.3% response rate. The reported response rate was 18.8% return rate observed for the 2008–2009 survey, and was the best return rate we had observed since the 1995–1996 survey (39.0%). The total number of hunting license holders in Indiana during the 2010–2011 season was 190,883, down 0.6% from 192,123 license holders during the 2008–2009 season. Of 4,777 questionnaires returned by license holders, a total of 3352 (70.2%) actually hunted ≥ 1 small game species during the 2011–2012 season, resulting in an estimate of 133,942 small game hunters, a 1.3% decline from 2008–2009 (Figure 3). The following harvest data has been broken down for each species. (The percentages in parenthesis show the increase or decline in participation or harvest compared to the survey conducted after the 2008–2009 season)

Hunter Demographics and Satisfaction

Species Hunted: Of our survey respondents (4658), 42.3% hunted cottontails, 47.8% hunted squirrels, 29.4 % hunted furbearers, and 23.1% hunted non-migratory game birds. Of the last group, 28.2% of those required to purchase the game bird habitat stamp privileges did not purchase those privileges for the 2010–2011 season.

Land Use: 56.7% of survey respondents who hunted small game reported hunting only on private land, while 5.6% reported hunting only on public land. Overall, 94.4% of Indiana's small game hunters used some private ground, while 43.3% used some public lands. Of survey respondents who hunted furbearers, 60.9% reported hunting only on private land, while 2.7% reported hunting only on public land. Overall, 97.3% of Indiana's furbearer hunters used some private ground, while 39.1% used some public lands.

Satisfaction: Overall, 80.8% of small game and furbearer hunters were satisfied with their 2010–2011 hunting experience. Non-resident small game hunters were the most satisfaction at 90.2%, fol-

lowed by northeast Indiana hunters at 84.1%. The least satisfied were hunters residing in central Indiana (78.1%). Satisfaction rates varied depending on what type of land hunters utilized. 83.2% of those hunting only private land, 79.4% of those hunting both private and public land, and 66.5% of those hunting only public land were satisfied with their 2010–2011 hunting experience.

Small Game Hunting and Harvest

Eastern Cottontail: An estimated 80,894 cottontail hunters (+16.5%) harvested an estimated 248,985 (+25.3%) in Indiana during the 2010–2011 season. 79.9% of hunters pursuing cottontails were satisfied with their hunting experience. Hunters in southwest Indiana had the greatest success averaging 0.75 cottontails harvested per day of hunting effort. The average cottontail hunter in Indiana spent 5.4 days in the field (+23.5%) and harvested 3.1 cottontails (+7.6%) during the 2010–2011 season.

Fox Squirrel: An estimated 84,295 fox squirrel hunters (+10.0%) harvested an estimated 375,117 fox squirrels (+18.9%) in Indiana during the 2010–2011 season. 83.8% of hunters pursuing fox squirrels were satisfied with their hunting experience. Hunters in the southeast had the greatest success averaging 0.91 fox squirrels harvested per day of hunting effort. The average fox squirrel hunter in Indiana spent 6.6 days in the field (+20.2%) and harvested 4.45 fox squirrels (+8.1%) during the 2010–2011 season.

Gray Squirrel: An estimated 62,699 gray squirrel hunters (+21.0%) harvested an estimated 212,033 gray squirrels (+52.6%) in Indiana during the 2010–2011 season. 83.8% of hunters pursuing gray squirrels were satisfied with their hunting experience. Hunters in south-central Indiana had the greatest success averaging 0.64 gray squirrels harvested per day of hunting effort. The average gray squirrel hunter in Indiana spent 6.6 days in the field (+11.2%) and harvested 3.4 gray squirrels (+8.4%) during the 2010–2011 season.

Northern Bobwhite: An estimated 15,080 bobwhite hunters (+7.7%) harvested an estimated 19,866 bobwhites (–5.9%) in Indiana during the 2010–2011 season. 60.5% of hunters pursuing bobwhites were satisfied with their hunting experience. Hunters in south-central Indiana had the

greatest success averaging 0.45 bobwhites harvested per day of hunting effort. The average bobwhite hunter in Indiana spent 3.6 days in the field (+13.3%) and harvested 1.3 bobwhites (-12.6%) during the 2010–2011 season.

Ring-necked pheasants: An estimated 12,581 pheasant hunters (+12.3%) harvested an estimated 8,853 wild ring-necked pheasants (+18.1%) in Indiana during the 2010–2011 season. 70.1% of hunters pursuing pheasants were satisfied with their hunting experience. Hunters in the major region (Figure 2a) had the greatest success averaging 0.46 wild ring-necked pheasants harvested per day of hunting effort. The average pheasant hunter in Indiana spent 2.2 days in the field (+13.3%) and harvested 0.70 wild ring-necked pheasants (+5.2%) during the 2010–2011 season. Additionally, 12,089 hunters (+0.3%) harvested 45,245 game-farm or “Put-and-Take” pheasants (+33.0%), averaging 2.3 pheasants per day of effort (+9.1%).

Ruffed Grouse: An estimated 1,967 grouse hunters (+26.4%) harvested an estimated 253 ruffed grouse (+110.9%) in Indiana during the 2010–2011 season. 52.1% of hunters pursuing grouse were satisfied with their hunting experience. Hunters in south-central Indiana had the greatest success averaging 0.09 ruffed grouse harvested per day of hunting effort. The average grouse hunter in Indiana spent 1.9 days in the field (+4.6%) and harvested 0.13 ruffed grouse (+66.8%) during the 2010–2011 season.

American Crow: An estimated 14,015 crow hunters (+18.5%) harvested an estimated 40,837 crows (-3.2%) in Indiana during the 2010–2011 season. 81.6% of hunters pursuing crows were satisfied with their hunting experience. Hunters in southwest Indiana had the greatest success averaging 2.7 crows harvested per day of hunting effort. The average crow hunter in Indiana spent 2.3 days in the field (-2.3%) and harvested 2.9 crows (-18.4%) during the 2010–2011 season.

Furbearer Hunting and Harvest

Raccoon: An estimated 24,055 raccoon hunters (+36.8%) harvested an estimated 117,265 raccoons (-21.5%) in Indiana during the 2010–2011 season. 79.8% of hunters pursuing raccoons were satisfied with their hunting experience. Hunters in northeast Indiana had the greatest success averaging 0.82

raccoons harvested per day of hunting effort. The average raccoon hunter in Indiana spent 7.2 days in the field (-29.1%) and harvested 4.9 raccoons (-42.6%) during the 2010–2011 season.

Virginia Opossum: An estimated 5,450 opossum hunters (+89.4%) harvested an estimated 9,060 opossums (+18.2%) in Indiana during the 2010–2011 season. 80.1% of hunters pursuing opossum were satisfied with their hunting experience. Hunters in northwest Indiana had the greatest success averaging 0.42 opossums harvested per day of hunting effort. The average opossum hunter in Indiana spent 6.6 days in the field (-37.6%) and harvested 1.7 opossums (+13.6%) during the 2010–2011 season.

Striped Skunk: An estimated 1,762 skunk hunters harvested an estimated 1,779 striped skunks in Indiana during the 2010–2011 season. 74.4% of hunters pursuing skunks were satisfied with their hunting experience. There was insufficient data to calculate regional efforts. The average skunk hunter in Indiana spent 5.5 days in the field and harvested 1.01 skunks during the 2010–2011 season. Data were not compared to data from the 2008–2009 due to insufficient amount of data.

Red Fox: An estimated 11,310 red fox hunters (+35.9%) harvested an estimated 4,189 red fox (+76.6%) in Indiana during the 2010–2011 season. 71.5% of hunters pursuing red fox were satisfied with their hunting experience. Hunters in southeast Indiana had the greatest success averaging 0.12 red fox harvested per hunting effort. The average red fox hunter in Indiana spent 5.8 days in the field (-14.7%) and harvested 0.37 red fox (+30.0%) during the 2010–2011 season.

Gray Fox: An estimated 7,008 gray fox hunters (+38.6%) harvested an estimated 1216 gray fox (+193.0%) in Indiana during the 2010–2011 season. 71.6% of hunters pursuing gray fox were satisfied with their hunting experience. Hunters in southeast Indiana had the greatest success averaging 0.07 gray fox harvested per day of hunting effort. The average gray fox hunter in Indiana spent 5.5 days in the field (-14.0%) and harvested 0.17 gray fox (+145.8%) during the 2010–2011 season.

Coyote: An estimated 44,791 coyote hunters (+41.8%) harvested an estimated 42,762 coyotes

(+46.8%) in Indiana during the 2011–2012 season. 73.1% of hunters pursuing coyotes were satisfied with their hunting experience. Hunters in south-central Indiana had the greatest success averaging 0.22 coyotes harvested per hunting effort. The average coyote hunter in Indiana spent 5.1 days in the field (+6.4%) and harvested 0.95 coyotes (+3.5%) during the 2010–2011 season.

Discussion

Although there had been a long-term decline in estimated number of small game hunters (Figure 3), we observed an increase in the number of small game hunters in 2008 from an all-time low of 126,924 in 2005; however, small game hunter numbers declined slightly again in 2010. Yet counter to the decline in small game hunters, the survey revealed increased hunter numbers for every species. This discrepancy can likely be attributed to changes in the number of migratory game bird hunters which are not included in this report. The number of mourning dove hunters declined from 14,300 in 2008 (Sanders and Parker 2010), to 10,000 in 2010 (Veverka 2011). The number of woodcock hunters increased from 900 in 2008 (Cooper and Parker 2009), to 1,000 in 2010 (Cooper and Parker 2011).

The increases in the number of small game hunters for each species, however, did not lead to increases in harvest for all species. Declines in the harvest of raccoon and crow, similar to those of 2010, occasionally occur for these species, but have not been indicative of continued decline. Both species typically have harvests near record highs. Where there is continued concern is in game bird harvests, which remain near record lows. Though the pheasant harvest rebounded some in 2010, the bobwhite harvest continued its steady decline begun in the mid-1990s, to reach a new record low. The ruffed grouse harvest remain so low that its validity though a hunter questionnaire could be questionable.

Though small game numbers have declined for decades and game is harder to find, more hunters were satisfied than unsatisfied with their hunting experience for all species. Expectedly, satisfaction rates were lowest for grouse, bobwhite, and pheasant. Also, hunter satisfaction was lowest when hunters used public land only. Obviously, when game is difficult to find and hunters have to compete for space, the small game hunting experience is much less enjoyable.

Small game species need early successional habitat, along with quality forage and adequate year-round cover. These types of habitat are significantly lacking in Indiana, and the additional loss of Conservation Reserve Program land over the next few years will likely have a detrimental effect on some populations of small game. We must create and maintain suitable habitat for all small game species and continue to manage the harvest in the best interest of the species. Without these efforts, small game populations will continue to decline.

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SMALL GAME & FURBEARER HARVEST SURVEY

State Form 28405 (R15/8-10)

Dear License Holder:

You have been selected at random to receive the Division of Fish and Wildlife's small game & furbearer harvest survey. Please take time to answer the following questions as accurately as possible. The information you provide will be used to determine statewide hunter participation and harvest, and will help us improve the management of our small game and furbearer species. Your answers to this survey are important, whether you hunted small game or not. Because of the importance of this survey, anyone who returns their survey will be entered into a drawing for a \$50 gift certificate toward the purchase of a hunting, trapping, or fishing license. Please return the survey in the enclosed envelope.

NO POSTAGE NECESSARY!

Thank you for your participation.

1. What is your county of residence? (If Non-resident, write "NR")

2. Did you hunt any of the following small game or furbearer animals in Indiana during the 2010-2011 hunting season: rabbit, fox squirrel, gray squirrel, mourning dove, bobwhite quail, wild pheasant, pen-reared pheasant, ruffed grouse, woodcock, crow, raccoon, opossum, red fox, gray fox, striped skunk, or coyote?

☐ Yes
 ☐ No (If "No", skip the remaining questions and return the survey)

Small Game Hunting Information

1. How would you rate your small game hunting experience in Indiana during the 2010-2011 hunting season?

☐ Very Satisfied
 ☐ Satisfied
 ☐ No Opinion Either Way
 ☐ Very Unsatisfied
 ☐ Unsatisfied

2. Do you plan to continue to hunt small game in Indiana during next year's hunting season?

☐ Yes
 ☐ No
 ☐ Unsure

3. Which small game animals did you hunt in Indiana during the 2010-2011 hunting season? (mark all that apply)

☐ Rabbit
 ☐ Fox Squirrel
 ☐ Gray Squirrel
 ☐ Wild Pheasant
 ☐ Pen-Reared Pheasant
 ☐ Mourning Dove
 ☐ Bobwhite Quail
 ☐ Ruffed Grouse
 ☐ Am. Woodcock
 ☐ Crow

4. For each small game species you hunted in Indiana, as indicated in the previous question, please record in the boxes below the county where you most often hunted that animal, the number of days you hunted that animal, and the total season harvest for that animal.

	County Most Often Hunted	Days Hunted	Total Harvest
Rabbit	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Fox Squirrel	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Gray Squirrel	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Wild Pheasant	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Pen-reared Pheasant	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Bobwhite Quail	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Mourning Dove	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Ruffed Grouse	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Am. Woodcock	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>
Crow	<div style="border: 1px solid black; width: 100px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>	<div style="border: 1px solid black; width: 50px; height: 1.2em;"></div>

PLEASE COMPLETE THE QUESTIONS ON THE BACK SIDE OF THIS SHEET

Figure 1. Example of the 2011 Small Game & Furbearer Harvest Questionnaire sent to 15,650 license holders following the 2010-2011 hunting season.

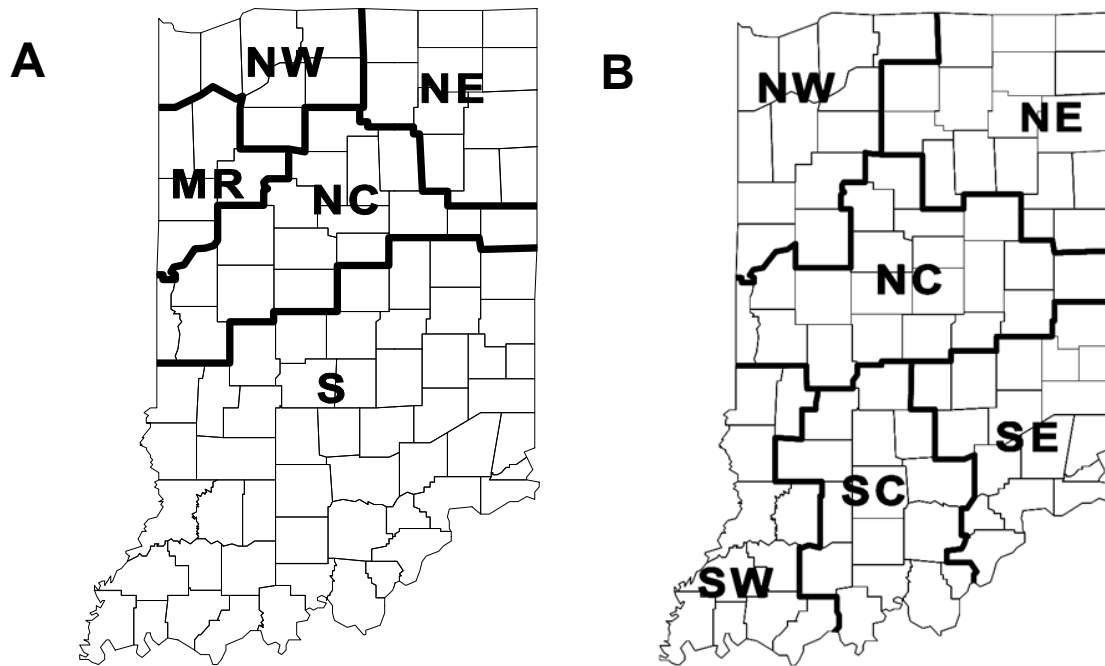


Figure 2. Maps showing Indiana's (A) pheasant harvest regions and (B) small game (excluding pheasant) harvest regions.

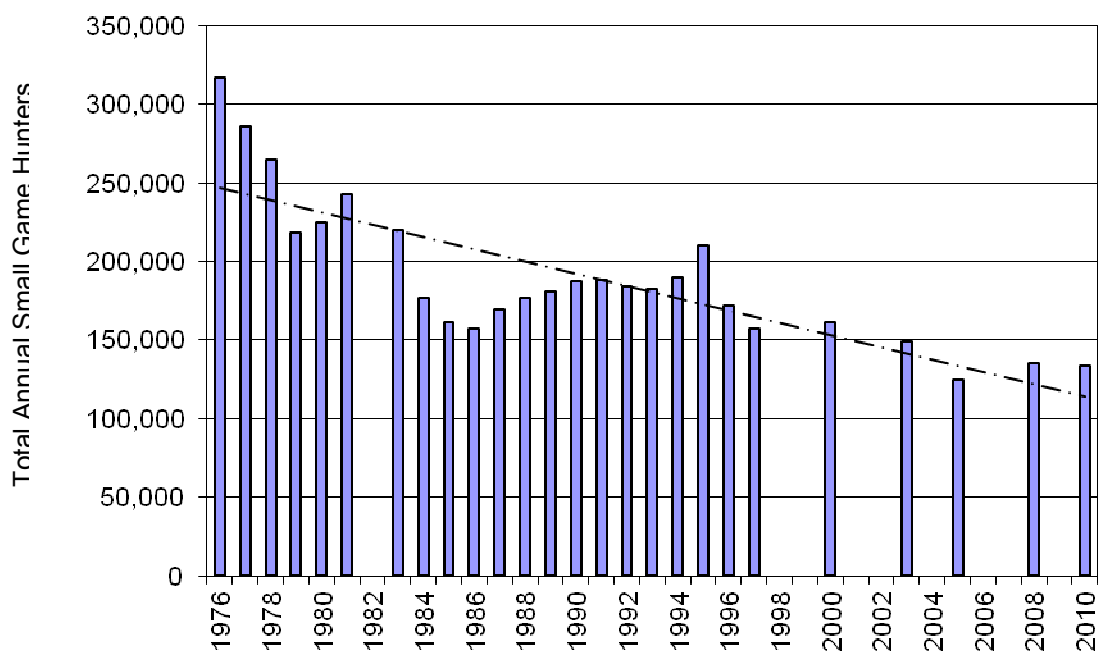


Figure 3. The number of small game hunters in Indiana estimated from the small game harvest survey, 1976-2010 (trend line shown; survey was not conducted in years displaying no data).